PHMC Lessons Learned **Fluor Hanford Inc.**

Caution Bulletin

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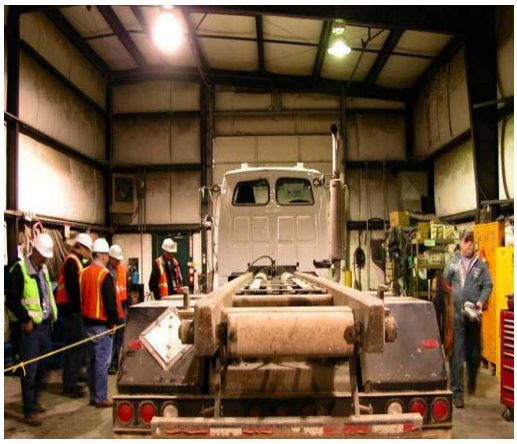
Title: Reeving Cable Incident Results in Personnel Injuries

Date: August 16, 2006

Identifier: 2006-RL-HNF-0033

Lessons Learned Summary: Oversight of operations should occur on a frequent basis to verify that our work practices are consistent with applicable safety requirements and documentation. By observing operations we should assess that the proper tools and procedures are being used, training is adequate, and thorough job hazard analysis are conducted.

Discussion of Activities: Two workers were injured while performing routine maintenance activities on a roll-on/roll-off container transport truck reeving cable. After completing their inspection and determining that the reeving cable clamps were properly torqued, the crew attempted to release the tension in the reeving cable. In the process of releasing tension on the reeving cable, tension was accidentally increased, causing a bolt in the tie-down chain to break. (The tie-down chain had been improperly lengthened by bolting two chain segments together). As a result, the chain flew from the truck, striking one employee in the chest, while the connecting link (D-Ring) at the end of the reeving cable struck the cab of the truck, breaking the rear window glass, causing lacerations to the other employee.



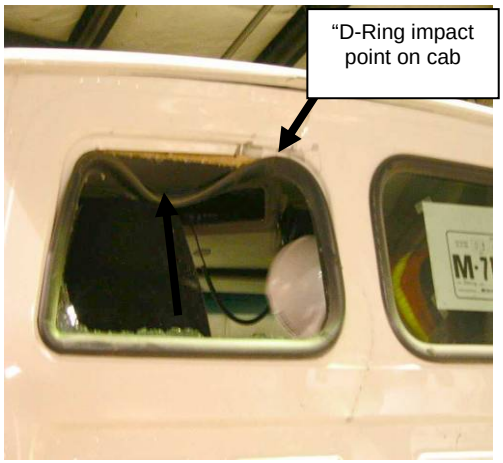
View of Truck (taken near where the mechanic was standing)

Analysis: A job specific Activity Hazard Analysis (AHA) had not been written and management was relying on “skill-of-the craft” to complete this task. A bolted chain (an improper tool) was substituted for a dedicated single piece alloy chain.

Human factor analysis concluded that the AHA did not identify the torque verification maintenance as a high tension activity. Therefore, the activity did not receive the required focus during development or implementation.

Since this was considered part of routine maintenance, a skill-of-the-craft focus was deemed appropriate. Since the task was characterized as skill-of-the-craft and assumed that on-the-job training would be sufficient there was no formal training.

In regards to management oversight, the process was considered routine maintenance. It is uncertain if the



Second worker was looking through window.

supervisors (or others) had observed the torque verification process with the bolted-chain.

Recommendations: As a result of this incident, the reeving cable maintenance procedure was revised. Both configurations of reeving cable installations were observed (long trucks requiring tensioning the cable to set the becket into the wedge and on short trucks using a battery operated torque wrench). The new procedures introduced controls on the reeving cable to minimize uncontrolled movement by either using a hand-activated ratchet lever-hoist (come-along) and a backlash safety strap (sling) to restrain the reeving cable while under tension or using the torque wrench to eliminate the need for tensioning the cable. The new procedure also defines a keep clear zone for workers. Additional recommendations include:

- Conduct more frequent inspections and observation (walkabouts) to review and question operations. Include observations/inspections of tools and equipment. Schedule these observations/inspections during different work evolutions.
- Establish expiration dates on AHA's to mandate reassessments (at least annually or when methods or tools change). This is particularly important to generic type hazard assessments like shop work, routine operations, etc.
- Review task considered as "skill-of-the-craft" and supplement with procedures and training if the hazard analysis identifies potential energy releases (such as the reeving cable under tension).
- Review high hazard and skill-of-the-craft activities for alternative methods/tools to reduce the exposure.
- Emphasize the inspection of tools for damage/proper planned use prior to working with them.
- Emphasize the use of job-specific tools (do not allow substitutes or repairs, such as a bolted chain).

Cost Savings/Avoidance: NA

Work Function: Conduct of Operations/Work Planning, Environmental Restoration, Maintenance/Mechanical, Management, Operations/Heavy Equipment

Hazards: Personnel Injury/Mechanical Injury (Striking Crushing)

Keywords: Cable, Hazards Analysis, Reeving Cable, Roll-On/Roll-Off Truck

Originator: Fluor Hanford, Inc., Submitted by Washington Closure Hanford

Contact: Project Hanford Lessons Learned Coordinator; *(509) 372-2166; e-mail: PHMC_Lessons_Learned@rl.gov*

References: EM-RL--WCH-ERDF-2006-0001, RCCC Lessons Learned - RCCC--6-0004